

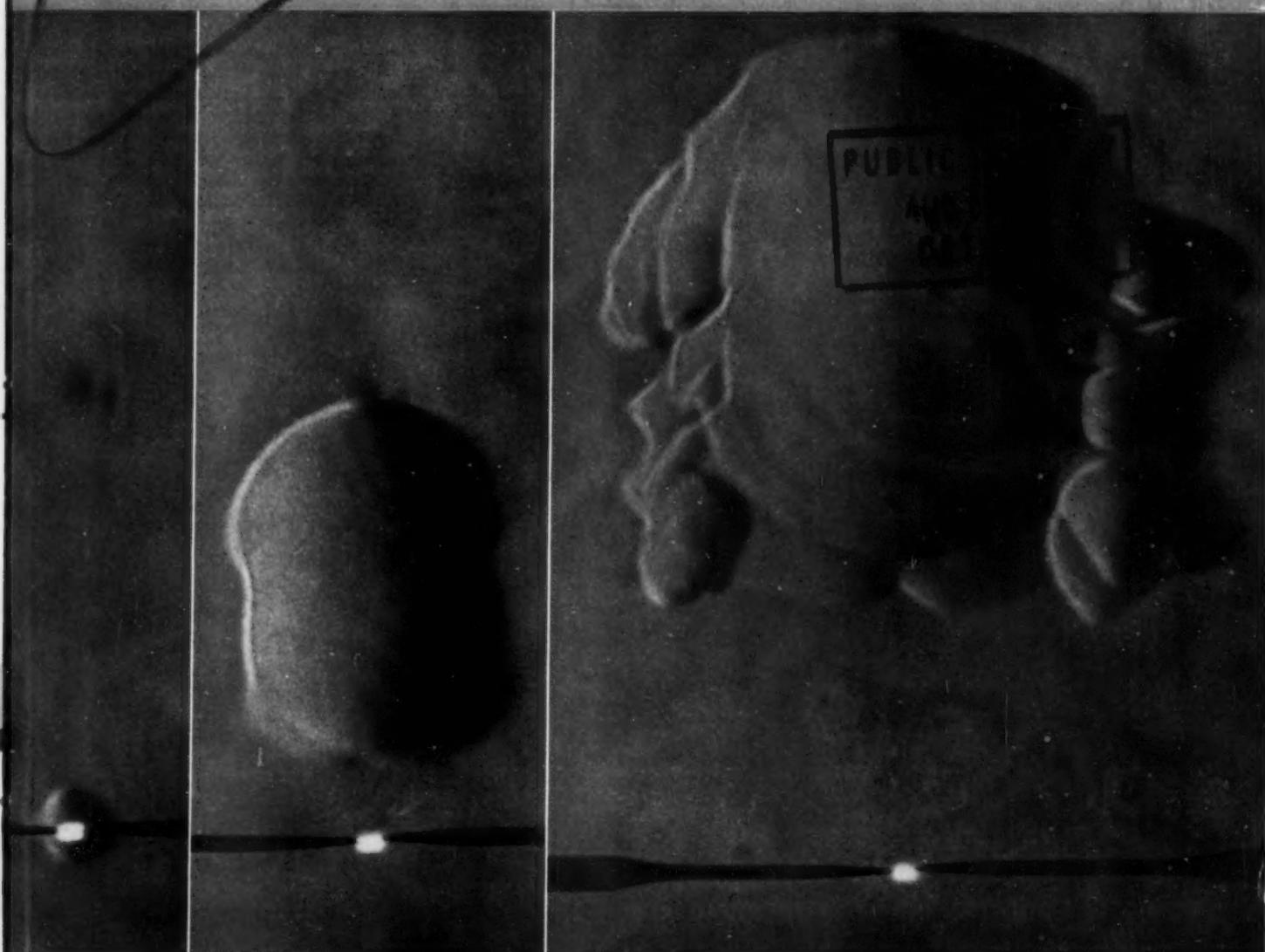
**TECHNOLOGY**

15

**August 11, 1951**

# SCIENCE NEWS LETTER

# THE WEEKLY SUMMARY OF CURRENT SCIENCE



## **Flame's Birth**

**See Page 93**

A SCIENCE SERVICE PUBLICATION

**\$5.50 A YEAR**

VOL. 60 NO. 6 PAGES 81-96

## DENTISTRY

# Gum Reduces Decay

**Cheewing special nitrofuran gum for 10 minutes after each meal reduces caries. It is sugarless, but flavored with peppermint. Not yet on market.**

► CHEWING GUM for 10 minutes immediately after each meal will substantially reduce tooth decay if the chewing gum contains a chemical called nitrofuran.

This special nitrofuran chewing gum is credited with preventing new decay in 60% of those using it in preliminary experiments. These are reported in the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION (Aug.) by Drs. Samuel Dreizen and Tom D. Spies of Northwestern University and Hillman Hospital, Birmingham, Ala.

The number of patients in the experiment is so small that the findings must be considered preliminary, Drs. Dreizen and Spies state.

The 30 patients who chewed the special gum for the year of the experiment had an average of 0.8 new cavities each. Another 25 patients chewed gum composed of the same chemicals but lacking the nitrofuran. The average of new cavities in this group for the year was three. A third group of 25 did not chew any gum routinely and did not get the special gum. In this group new cavities averaged 3.8 per person.

The 80 persons who volunteered for the experiment were all between the ages of six and 38 and all had signs of active tooth decay at the start of the experiment. No attempt was made to change the diet

or mouth hygiene and toothbrushing habits of any of them during the period of the experiment.

The experimental chewing gums were flavored with peppermint but contained no sugar. They are not yet on the market.

Nitrofuran, the potential anti-tooth decay ingredient, has been used chiefly as an anti-germ chemical to prevent infections in wounds. It acts by interfering with the ability of susceptible germs to utilize some of the B group of vitamins, notably thiamin and nicotinic acid. These two vitamins are essential for the maximum growth of Lactobacillus acidophilus, the microorganism most commonly associated with the start of tooth decay in humans. The two vitamins are also involved in the bacterial degradation of sugar to acids capable of dissolving tooth structure.

Laboratory tests showed that the yellow crystalline nitrofuran known by the trade name of Furadroxyl was most effective in checking decay and that it was non-irritating and not toxic so it could safely be used. It was put into chewing gum for use after meals because recent evidence shows that tooth decay is not a continuous process but goes on most actively during the half hour after eating sugars and fermentable starches.

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## PUBLIC HEALTH

# Summer Sneeze Season

► THE SUMMER sneeze season is on for the millions of persons in the United States who suffer from hay fever due to ragweed pollens. In the old days, hay-feverites who could flee to ragweed-free regions in the north and stayed there till the season was over. The others suffered at home. Now they have three modern scientific aids to help them comfortably through the hay fever season. These are sprays, "shots" and drugs.

The sprays are for killing the ragweed. Many communities conduct ragweed control campaigns every spring and summer.

Sprays of a different kind may also be used by the hay fever sufferer to clear his stuffy nose, but most hay fever specialists in the medical profession agree that best treatment consists of immunizing "shots" plus antihistamine drugs.

Experienced hay-feverites know that the "shots" are best given in the spring, so that enough tolerance can be built up to

withstand the pollen blowing about at this time of the year. But the "shots" help even when started during the hay fever season.

Hay fever sufferers should see a doctor both to get this treatment and to find out which antihistamine will give the most relief and how much to take. While some of these drugs can be bought at the drug store without a prescription, it is wiser and safer to find out from your doctor which one to get and how much to take. Overdosing with them, which may tempt a desperate hay-feverite, is dangerous for anyone.

The hay-feverite must guard against a special danger from them. The drugs do not keep the pollen from entering the nose, though they relieve the nasal symptoms. If the patient is not getting immunizing treatment, the "shock" organ affected by the pollens may change from the nose to lower in the breathing tract and cause asthma.

Hay-feverites are usually advised to keep away from drafts and breezes that stir up dust and pollen and to avoid chilling. Air conditioning which filters out pollen and dust is helpful, but if it cools the air too much, it may make the hay-feverite more miserable. His ability to react to the chilling process is altered and a sudden drop in temperature may cause abnormal swelling of tissues in the nose with consequent stuffiness and sneezing.

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## MEDICINE

## Spinal Curvature Worst Polio Aftermath

► WORST AFTER-MATH of polio is spinal curvature, medically termed scoliosis, Dr. John R. Cobb of the Hospital for Special Surgery in New York declares.

A shrivelled, useless arm or leg usually seems to the layman to be the worst, most crippling after-effect of the disease. These can be extremely disabling and difficult to treat. But, says Dr. Cobb, they do not endanger the life of the patient.

"Extensive trunk involvement with resulting scoliosis may, however, he says, 'not only be extremely disabling with very severe deformity, but may seriously impair the patient's health."

Dr. Cobb will report on 165 cases with scoliosis following infantile paralysis at the Second International Conference on Poliomyelitis in Copenhagen, Denmark, in September.

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## ENTOMOLOGY

## Mosquito Fighting Needed In Midwest Flood Areas

► RESIDENTS of the Midwest's flooded areas can expect to battle mosquito hordes whose ranks are swelled at regularly spaced intervals for some time to come. The peaks, or waves, of mosquitoes will be about one week apart.

There may be 200 times as many of the pests as in the pre-flood period. Regular swellings of the mosquito's ranks by new generations apparently are reflections of the main peak occurring soon after the flood waters recede, concludes Dr. Burton B. Hodgden, entomologist with the Kansas State Board of Health. His findings are based on a study of the number of mosquitoes trapped after a relatively small flood at Great Bend, Kans., last year.

Two weeks after the flood, the trap catches increased sharply, he reports. City-wide spraying with DDT was effective in controlling the pests, but it had to be repeated regularly to keep the mosquito numbers down. Different species of mosquitoes trapped jumped from a pre-flood four to 12 at the height of the post-flood outbreak.

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## MEDICINE

# Fatal Diseases Stopped

**Forgotten drug turning out to be cure for two deadly diseases caused by yeast-like fungi, blastomycosis and actinomycosis.**

► A DRUG so disappointing its manufacturer never put it on the market is now turning out to be a "cure" for two highly fatal diseases caused by yeast-like fungi.

"Cure" may be too strong a word to use right now. But four patients have already been saved by it and doctors using it say it is "better than anything used before."

Name of the drug is stilbamidine. The diseases in which it is now giving good results are North American blastomycosis and actinomycosis, known also as "lumpy jaw" when it attacks cattle.

The first patient to get this new medicine for blastomycosis was a 33-year-old Indian. For about a year he had trouble swallowing. This got so bad that he could hardly take any food and lost about 40 pounds in five months. At the first hospital he went to it was thought he had cancer of the esophagus, or gullet. The diagnosis of blastomycosis was made, by finding the yeast-like fungi in material from his throat, after he had been transferred to the Veterans Administration Hospital at Fort Howard, near Baltimore.

Details of this case are reported to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug. 4) by Drs. Emanuel B. Schoenbach, Joseph H. Miller, Milton Ginsberg and Perrin H. Long, of Johns Hopkins School of Medicine, Baltimore. Drs. Miller and Ginsberg are also on the surgical staff at the Fort Howard VA Hospital.

The first patient showed "marked improvement" and normal temperature in less than three weeks after stilbamidine and a related chemical, propamidine, were started. Three months after coming to the Fort Howard Hospital and after three courses of stilbamidine and propamidine the patient was well, had gained 37 pounds, had a good appetite and was no longer harboring the yeast-like fungi in his throat.

The "excellent" results in this and other cases lead the Baltimore doctors to advise giving the drugs "an extensive trial in the treatment of severe yeast-like infections."

Stilbamidine and related chemicals of the diamidine group were tried in 1939 as remedies for the tropical disease, kala-azar. Pentavalent antimony compounds were found to be much better, so the diamidines were temporarily shelved. Then in 1947 they were revived for treatment of multiple myeloma, a malignant bone marrow disease. Although first reports were promising, the chemicals again were found not very satisfactory.

Meanwhile in 1945 a Chicago scientist, W. O. Elson, reported that in the test tube some of these compounds had ability to stop the organism that causes blastomycosis. Dr. Schoenbach at Johns Hopkins later called attention to the treatment possibilities of this report. Discussion of this among the group at Johns Hopkins led to trial of the drugs in cases of blastomycosis and actinomycosis at the Veterans Hospital and at the U. S. Marine Hospital and University Hospital.

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## PUBLIC HEALTH

## Bumper Baby Crop Predicted for This Year

► A BUMPER CROP of babies is expected this year by statisticians of the U. S. Public Health Service.

The number born during the first five months of the year, more than 1,500,000, is 8.4% more than were born during the same period in 1950 and is near the all-time record of 1947. At the present rate, 1951 will set a new record.

The Korean War which started a marriage license upswing in June, 1950, is believed responsible. March saw the start of a marked upswing in births with increases of 13% and 14% in April and May over the same months last year.

On an annual basis, the birth rate for the first five months of 1951 was 23.9 per 1,000 population.

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**BABY SARUS CRANE**—What may be the first sarus crane ever to hatch in the United States pecked its way out of the shell at the Philadelphia Zoo over the week-end of July 21. Although his parents stand about six feet tall, the little chick measures only nine inches high.

## RADIO

# Lifting of UHF-TV Freeze

**Expect that within a year the number of television broadcasting stations will double, following anticipated lifting of government "freeze."**

► WITHIN A year the number of television broadcasting stations in the United States will double or even triple, it is expected. This great expansion will follow the lifting of the present government "freeze" on television stations, action expected in the near future.

This freeze was imposed by the Federal Communications Commission in September 1948 because of a shortage of wavelength channels in the air. Nearby stations must use widely separated wavelengths or they interfere with each other. The development of new ultra high frequency channels will now permit the installation of many new stations.

At the present time there are 107 television broadcasting stations in the country and while a high percentage of the nation's population is within television range about half the area of the country is outside. Television networks are extending rapidly, using either coaxial cable or relay stations, but broadcasting stations are needed to transmit their programs through the air to home receivers.

The ultra high frequency systems to be used will use channels between 470 and 890 megacycles. A megacycle is 1,000 kilocycles, and a kilocycle is 1,000 cycles. A frequency of 470 megacycles means, therefore, that the transmitter sends out 470,000,000 waves each second. Standard radio, for example, is broadcast on frequencies from about 500 to 1,600 kilocycles.

Present television operates in what is called very-high frequencies (VHF) from 50,000 to 216,000 kilocycles. The present 107 television stations are operating over 12

VHF channels within this range. By proper placement, additional stations can use these same 12 channels. Tentative allocations by the Federal Communications Commission will permit the opening of 450 additional VHF stations.

The FCC proposals for the new ultrahigh frequency (UHF) would permit telecasts by 1,357 stations over 52 additional stations. A considerable number of these will be in cities of perhaps less than 100,000 population. They will be low-power, with a range of perhaps one-fourth or one-fifth of the ordinary VHF television reception range which is usually 40 to 60 miles.

Present VHF television receivers will not be able to pick up UHF telecasts without the addition of some sort of a special device. Most manufacturers of television receivers already have such a device ready for production as rapidly as needed. In a type developed by General Electric, called the G-E translator, adjustment from VHF to UHF reception is made by a flick of a switch.

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## NECROLOGY

## Harry L. Smithton, Trustee, Dead of Heart Attack, Aug. 5

► HARRY L. SMITHTON, long a trustee of Science Service and formerly secretary to the late E. W. Scripps, founder of the Scripps-Howard newspapers and Science Service, died Aug. 5 in La Jolla, Calif., from a heart attack. His family requested that those who wished should send con-

tributions to the Scripps Metabolic Clinic at La Jolla, Calif., instead of flowers. Mr. Smithton became a trustee of Science Service in 1928, but his work with Mr. Scripps had brought him into close contact with the beginning and growth of the organization from its start in 1921. For a number of years, Mr. Smithton served as treasurer of Science Service.

Science News Letter, August 11, 1951

Bamboo, instead of steel, is being used experimentally as reinforcing in concrete with apparent success.

## SCIENCE NEWS LETTER

VOL. 60 AUGUST 11, 1951 No. 6

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc. 1719 N St., N. W., Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C.; Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STATE 2-4822.

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The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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## BIOPHYSICS

# Plants Made Poisonous

**Insecticides that are stored in plant cells to poison insects that feed on the plants are being studied in Britain by radioactive tagging.**

► BY TAGGING plant insecticides with radioactive elements and then following the radioactivity about in the plants, British agricultural scientists have been learning a lot about how the plants lap up the insecticides and become poisonous to pests.

The pest-killers being studied are of a new type known as systemic insecticides. They are taken up by the plants and stored in the cells where, though harmless to the plants themselves, they poison insects which feed on the plants.

These systemic insecticides are all compounds of phosphorus and by preparing them from radioactive phosphorus the scientists are able to trace their course after they are sprayed onto plants.

The insecticide of this group particularly studied by Drs. S. H. Bennett and W. D. E. Thomas, of Bristol University, is bis (bis dimethylamino phosphorus) anhydride. They labelled their insect poison with  $P^{32}$ , a radioactive form of phosphorus, and then dipped their plants into this tagged insecticide, or sprayed it onto the plants with an artists' spray pencil.

Then they washed off the excess and measured the amount of radioactivity coming from the leaves. In this way they could determine the amount of insecticide the plants took up under different conditions.

This study has great practical importance. The insecticide is water soluble and that which is not absorbed by the plant is readily washed off by rain, so it is essential to insure that it is sprayed on under such conditions that maximum absorption takes place.

Drs. Bennett and Thomas made two important discoveries: Leaves absorb more insecticide from their under surfaces than they do from their upper; and little insecticide is taken up if the plants are kept in the dark.

In view of the latter discovery farmers are well advised to do their spraying of phosphorus insecticides in the morning rather than in the evening. Rain during the night will remove practically all the insecticide sprayed on the previous evening, but rain following later in the day after a morning spray will find much less unabsorbed insecticide to wash away.

Two other British researchers, Dr. D. F. Heath and Mrs. M. V. Llewellyn, of Pest Control Ltd., confirmed the findings of Drs. Bennett and Thomas that light is essential for the efficient absorption of the phosphorus insecticides. In a study of insecticide absorption by Brassicas they found that over a period of 16 hours less than 10% of the

insecticide was absorbed if the plants were kept in the dark.

However, those plants kept in light after spraying absorbed over 80% of the insecticide. Almost as good absorption was found to take place when the plants were irradiated with artificially produced ultraviolet light from black bulbs.

The pest control scientists decided that the amount of insecticide absorbed depended on two factors. One of these was the amount of light they received; the other was the nature of the compound used.

In regard to the latter, the question to be settled was: Do the insecticides volatilize through the leaf surface to reach the interior, or do they diffuse across the leaf membrane?

Using  $P^{32}$  tagged insecticides, Drs. Heath and Llewellyn were able to show that the absorption by the plant follows the rule of semi-permeable membranes, that is, the size of the insecticide molecule is the determining factor, not its degree of volatility.



**RUBBER-STEEL BOND — Under nearly 1,000 pounds pull, the silicone rubber link between these two steel pieces is broken, though the rubber remains firmly bonded to the steel. A new glue-like chemical developed by General Electric Company chemists is responsible for the tenacious bond.**

A highly volatile member of the insecticide series will not penetrate into a leaf more quickly than the others, but one with a smaller molecule will.

This ties up well with the increased absorption produced by light, since it has been shown that light greatly increases the permeability of plant membranes to water and, therefore, presumably to substances dissolved in water.

Reporting specifically on a series of phosphorus insecticides they studied, the scientists listed their plant-penetrating powers in the following descending order: bis-dimethylamino-phosphorus fluoride; tris-dimethylamino-phosphine oxide; octamethyl-pyro-phosphoramide; bis-isopropylamino-phosphorus fluoride; tri-phosphoric acid penta (dimethylamide).

The unusual-looking word "phosphorus" means that this substance contains a combination of phosphorus and hydrogen, one to four, which is similar in chemical behavior to the nitrogen-hydrogen complex called ammonium.

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## ENTOMOLOGY

## Carbon Dioxide Attractive To Female Mosquitoes

► THE THING that attracts mosquitoes to you may be the carbon dioxide formed in your body and exhaled on your breath.

Studies suggesting this are reported by Dr. W. C. Reeves of the Hooper Foundation for Medical Research and the School of Public Health, University of California.

Dry ice, which is solidified carbon dioxide, was used for the source of the gas in Dr. Reeves' studies. Primary object of the studies was to find good bait for collecting mosquitoes for research of various kinds in connection with the diseases mosquitoes spread.

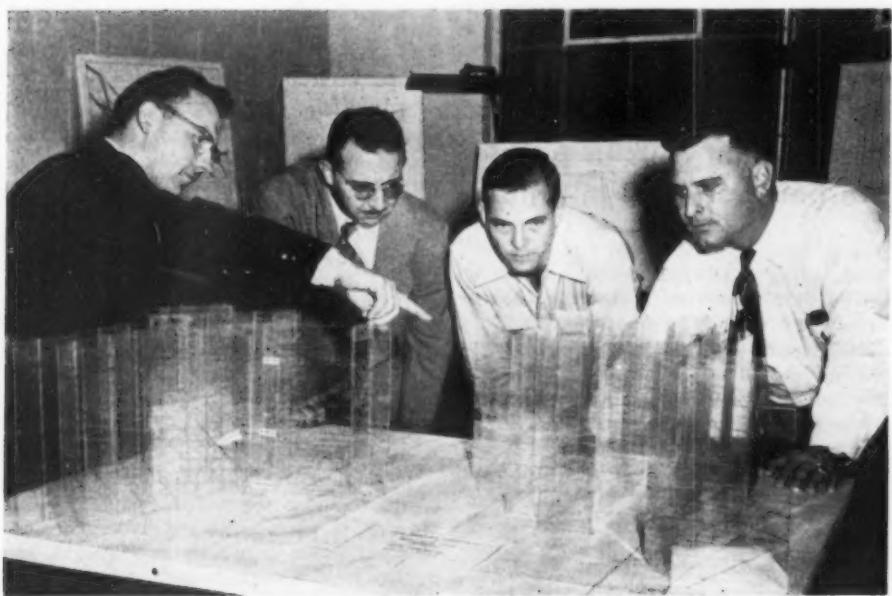
In 49 trials using dry ice to bait his traps, Dr. Reeves collected 14,277 female mosquitoes of six different species. The dry ice was consistently more attractive than animal bait such as calf or chickens.

Only six male mosquitoes were collected in the dry-ice baited traps, and only three males by the animal baited traps. This, Dr. Reeves suggests, may be further evidence that the attraction of carbon dioxide for mosquitoes is closely allied to search for a source of blood.

Why some species of mosquitoes bite humans, while others prefer birds and amphibian animals, may also be explained by the carbon dioxide attraction, Dr. Reeves thinks. *Culex apicalis*, for example, might be extremely sensitive to the small amount of carbon dioxide given off by amphibians such as salamanders and frogs, but would be repelled by the larger amounts from big animals like man.

Details of the study are reported in the PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE (May).

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**MODEL OIL FIELD**—A three dimensional model of the Heidelberg oil field in Mississippi is being shown to Venezuelan production men R. V. Tailleur, W. M. Sanders and J. V. Todd by J. B. Currie, left, geologist of Gulf Oil Laboratories in Pittsburgh.

#### ASTRONOMY

## Time Differences Explained

Korea's Monday is a Sunday in U. S. Days begin at International Date Line and advance in 24 principal separate steps around the world.

► WITH RECENT truce negotiations in Korea, during which people in New York on Sunday evening would hear over the radio that Monday morning sessions had already started, time differences in various parts of the world have been strikingly brought to our attention. And doubtless many share the confusion felt by one inquirer, who wishes enlightenment as to how this happens.

First of all, our time is based on the turning of the earth from west to east, which makes the sun and other celestial bodies seem to turn around us from east to west. The day is based on the time it takes for one complete turn, as measured from one moment when the sun crosses the meridian, i.e., is directly south, until it does so the next time.

A place south of us obviously is not south of a point farther west, so when the sun is on the New York meridian, marking noon, it has not yet reached the meridian of Chicago. There it is 11 in the morning. The sun is still farther from the meridian at Denver, where it is only 10 a.m.

This, of course, is the reason for time zones, and why it is necessary to set one's

watch back an hour for each 15 degrees of longitude travelled to the west. Going all the way around the earth, in this direction, one would set his watch back an hour 24 times, and would thus find himself a day behind his friends who had stayed at home—were not something done to correct it.

But "something" was done. It was decided to set one's calendar a day ahead at some stage of this westerly trip around the world. The place chosen is the International Date Line, which follows approximately the meridian of 180 degrees longitude. West of this line it is always the day after the one being marked to the east. Therefore, moving westward, one always shifts forward a day at the line, while he goes back a day on an easterly passage.

We may also consider the date line as the place where the new day is born. At noon, Greenwich time, which is 8 a.m. EDT, or midnight at the line, it begins. Suppose it has been Sunday. Then Monday starts, and advances toward the west with the shift of the meridian which marks midnight. After three hours (11 a.m. EDT) it has reached Japan, and after nine hours (5 p.m. EDT) the new day reaches Iraq.

It comes to central Europe 11 hours after it began (7 p.m. EDT) and to England and western Europe an hour after that.

Monday is 17 hours old when, by standard time, it reaches New York. It is then, of course, 1 a.m. by daylight time. Twenty-two and a half hours after the day began, it reaches the Hawaiian Islands, at 6:30 a.m. EDT. An hour and a half after that the midnight meridian reaches the date line once more. Tuesday then begins, and repeats the process.

Thus, General Ridgway, at his headquarters in Tokyo, is having luncheon when people in New York are going to bed the night before. The negotiators in Korea have just finished their morning session.

Actually, the day does not advance smoothly around the world, as indicated in this somewhat simplified description, but in 24 principal separate steps. Each covers an average of 15 degrees of longitude, or one of the time zones. It becomes Monday all at once from Maine to Michigan, and an hour later does the same from Kentucky to Texas. Throughout the world, however, there are many local variations from strict adherence to the time zones. Honolulu, for example, is practically on the border between two zones, so Hawaiian time is not different by a whole number of hours from that which we use. Instead, it is six and a half hours behind eastern standard time.

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#### PUBLIC HEALTH

## Safety Rules for Hurricane Season

► A LATE summer and fall danger to persons living or vacationing along the Atlantic seaboard or the Gulf coast is the hurricane. The U. S. Weather Bureau, which has been giving hurricane warning service since 1873, gives the following directions on safety measures:

1. Keep your radio on and listen for late warnings and advisories.
2. Pay no attention to rumors. Rely only on the official Weather Bureau advices and warnings.
3. Get away and stay away from low-lying beaches or other locations which may be swept by high tides or storm waves. If your only passage to high ground is over a road likely to be under water during a severe storm, then leave early. Don't run the risk of being marooned.
4. If your house is up out of the danger of high tide and is well built (securely anchored to foundation with a good roof also securely fastened) then it is probably the best place to weather out the storm.
5. Board up windows or put storm shutters in place. When you board up, use good lumber securely fastened. Makeshift boarding may do more damage than none at all. Have strong bracing for outside doors.

6. Get in extra food, especially things which can be eaten without cooking or with very little preparation. Remember that electric power may be off and you may be without refrigeration.

7. If emergency cooking facilities are necessary, be sure they are in working order.

8. Sterilize the bathtub and fill it with water, advises the Weather Bureau. Also sterilize and fill all jugs, bottles, cooking utensils and other containers. Even for some time after service has been restored it may be wise to boil drinking water, unless you are sure the supply received from the city's mains is safe. Your health department can tell you about this.

9. Have a flashlight in working condition and keep it handy.

Danger to life and health threatens even after the hurricane is over. To avoid some of these dangers, follow these rules of the U. S. Weather Bureau:

1. Seek medical care at Red Cross disaster stations or hospitals for persons injured during the storm.

2. Don't touch loose or dangling wires. Report such damage to the light and power company, or nearest police officer.

3. Report broken sewer or water mains to the water department.

4. Don't empty water stored in bathtubs or other receptacles until you are sure that a safe water supply has been restored.

5. Guard against spoiled food in mechanical refrigerators if power has been off any length of time.

6. Take down shutters and save the lumber. Store in a handy place for future use.

7. Beware of broken tree limbs. Collect fallen limbs and debris around the premises and pile along curb to facilitate collection.

8. Unless you are qualified to render valuable emergency assistance, stay away from disaster areas where you may hamper first aid or rescue work.

9. Drive automobiles cautiously. Debris-filled streets are dangerous so keep your eyes on the road. Along the coast the soil may be washed away from beneath the pavement, which may collapse under the weight of vehicles.

10. Be alert to prevent fires. Lowered water pressure makes fire-fighting difficult after storms.

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#### **INVENTION**

### **Bath Tub Use by Invalids Made Easier**

► THE USE of the bath tub is made easy for invalids by means of an improved bath chair on which patent 2,562,598 was issued to Margaret Brown as executrix of Omer G. Brown, deceased, of Kane, Pa. The seat is attached to a frame on the wall behind the tub and can be moved up and down to the bottom of the tub by manual operation.

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#### **ARCHAEOLOGY**

## **First Tree Felled By Man**

**Birch tree found in Yorkshire was cut down over 7,000 years ago and preserved because it was lying in a permanently water-logged area.**

► WHAT MAY very well be the first tree ever felled by man has just been dug up at Seamer, in the English county of Yorkshire. It is described by the British archaeologist Dr. Grahame Clark, in the American scientific journal, ARCHAEOLOGY (Summer).

The tree is a birch, cut down 7,000 to 8,000 years before Christ and preserved until now because it has been lying in an area that is permanently water-logged.

The woodsman was one of a hunter-fisher people who lived in England in the Middle Stone Age at the beginning of the post-glacial period when it was possible to walk across the North Sea. Flint blades of his roughly chipped adz were also found along with birch bark in tightly wound rolls like those in which the Lapps store their bark at the present day.

Every specimen of wood found in this archaeological site was identified as birch. These people were living before the spread of hazel and of such warmth-demanding trees as alder, oak, elm or lime. Analysis

of fossil pollen confirms that the forests of those times were dominated by birch, although a certain amount of pine and willow may have grown not far away.

Quantities of the bracket fungus *Fomes fomentarius* were found at the site. These have been used for tinder and other purposes by European peasants down to recent times, but no conclusive evidence was found that the Seamer people gathered them; they may have been brought in clinging to the birch brushwood. Samples of the birch have been dated by carbon 14 tests as 9,488 years old—plus or minus 350 years.

The Seamer people apparently used animal skins for clothing, tents and possibly even for boats. Deer antlers were worked into barbed weapons for the chase.

Science News Letter, August 11, 1951

#### **SURGERY**

### **Skin Flap Operation Relieves Neuralgia**

► A SKIN raising operation may relieve the intractable and often unbearable neuralgia that commonly follows an attack of shingles in old people, Drs. Kenneth H. Abbott and Bruce C. Martin of Ohio State University in Columbus find.

"Excellent relief from the burning pain" in two patients and "fair to good results" in a third are reported by them in the American Academy of Neurology's journal NEUROLOGY (July-Aug.).

The patient in whom results were only fair to good was a 63-year-old woman who had suffered a nervous break-down at the age of 33 and had shown various other neurotic symptoms.

The operation itself consists in cutting and lifting a flap of skin in the area affected by the pain. The cutting is done down to the muscle. The skin is then stitched back in place by silk sutures.

In this operation, both the nerves of sensation under the skin and also some of the sympathetic nerve fibers are cut. It is this double nerve-cutting that brings the relief, the Ohio surgeons believe.

One patient has been free of pain for three years, another for two years after the operation. This last has had return of sensation and some mild pain in the third year since the operation.

Only when the skin raising operation fails to give relief, Drs. Abbott and Martin state, should the more extensive kinds of nerve-cutting operations be tried.

Science News Letter, August 11, 1951



**OLDEST FELLED TREE**—Among the earliest traces of tree-felling yet found are these birch trees lying on the shore of the old lake at Star Carr, Seamer, Yorkshire, England, where recent excavations uncovered evidences of Stone Age men's work.

## ENGINEERING

**New Storage Battery Starts at 60 Below 0**

► A LIGHTWEIGHT storage battery that will start an automobile at 65 degrees below zero has been developed by use of a new method of grid construction that lead plates materials ordinarily corroded by the battery's sulfuric acid.

Urgently needed for military use in the far north, this improvement in the conventional lead-acid battery is also expected to have commercial application because it won't go dead when the car has been idle for a time.

Large amounts of lead used in standard batteries are replaced with aluminum, brass, iron and copper, making the battery lighter yet more powerful.

The new battery that has withstood operational tests at temperatures from 165 degrees above to 65 below zero Fahrenheit was developed by the University of Michigan Engineering Research Institute as an Army Ordnance project.

The new method of pure lead plating on a lighter metal base instead of the lead antimony alloy now used results in a low self-discharge rate. This gives a battery that will still start the engine after it has been in a car that has stood idle all winter. The new battery is expected to be used for standby duty in hospitals, power stations and telephone switchboards.

Science News Letter, August 11, 1951

## PHYSIOLOGY

**Swimming Good Exercise In Hot Summer Weather**

► SWIMMING IS more than good fun on a hot day. It is about the safest if not the best hot weather exercise. As one group of medical authorities have pointed out, the danger of overheating is completely eliminated in swimming. The air and sunshine as well as the exercise have wholesome effects on the body. And swimming allows the display of any amount of energy. Swimming great distances at fair speed develops the entire muscle system. At the other extreme, a person convalescing may float around on the water exerting very little energy, not even having to support his body weight as he would in walking.

There is danger of overdoing in swimming, as in other forms of exercise. Many drownings attributed to cramps have really resulted from the failure of overtaxed hearts. Don't swim until you are completely tired out. Exert yourself only to the point where your breathing is slightly quicker than usual, medical authorities warn. They also advise waiting an hour and a half after eating so the meal will be thoroughly digested before going into the water. If the water is cold, do not stay in until the body is chilled. Persons suffering from eye, ear or intestinal infections should not fre-

quent pools or beaches. They are a health hazard to others and at the same time run the risk of aggravating their own conditions.

The main source of ear infections from swimming comes from water getting from the back of the nose into the middle ear. If you are taught to swim properly, you will learn to breathe in a way to reduce the chances of this.

Science News Letter, August 11, 1951

## PSYCHOLOGY

**Brain Work Possible During Intense Noise**

► IT IS possible to do mental work while being bombarded with bursts of intense noise.

This was demonstrated in an experiment at Pennsylvania State College in State College, Pa., conducted by Dr. Kendon R. Smith.

In fact, you may even turn out more work than you would in a quiet place. The quality of your work may suffer slightly, but the loss of accuracy is so small as to be practically negligible.

The 35 students tested by Dr. Smith worked for 30 minutes in an auditorium, not a boiler factory, and the noise came from a loud speaker. It was intermittent rather than continuous because intermittent sound might be expected to be more disturbing and because it is more often encountered in practice. The students were working for cash prizes.

If loud noise has the bad effects that have been claimed, Dr. Smith concludes, they may show up in sustained performance or in other functions, not output.

Science News Letter, August 11, 1951

## METALLURGY

**Center Core Improves Vessels' Armor Plate**

► HEAVY ARMOR plate for vessels and war tanks is made by a process which brought patent 2,562,467 to James W. Kinnear, Jr., Pittsburgh, Pa. The United States Steel Company has acquired the patent rights. There is a center layer of a slightly different steel in this armor plate that permits hardening all through.

Armor plate of ordinary thicknesses is satisfactorily hardened by quenching. When the heavy plate now demanded in modern warfare is quenched the depth of hardening does not always reach the center. The new process uses in the center of the ingot, which is forged or rolled to form plate, a core of steel alloy of slightly different composition than the rest of the ingot. After working, the core forms a center layer between two outside layers. When the plate is quenched it hardens throughout.

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**IN SCIENCE**

## PUBLIC HEALTH

**Closed Kingdom of Nepal Anti-communist Outpost**

► ONLY ABOUT 300 foreigners have ever visited Nepal, the little kingdom that lies between India and Tibet, yet it is an anti-Communist outpost today. Dr. Carl Taylor, medical missionary connected with the Presbyterian Board of Foreign Missions, has predicted that foreigners will be more welcome in the future in this least known country in the world.

Dr. Taylor was interviewed by Watson Davis, director of SCIENCE SERVICE, in a program over the Columbia Broadcasting System.

With the Red Communist Chinese invasion of Tibet, this small country has taken on new interest. Within a 100 by 500 mile rectangle there are five of the six highest mountains in the world. It is estimated that altogether approximately 300 foreigners have visited Nepal. But Dr. Taylor went into an area which it is believed no foreigners have ever been before.

While in Nepal Dr. Taylor conducted a medical survey at the request of the government and aided in the collection of over 200 species of birds, including many new species of considerable scientific interest. In studying the health of the country, he treated the people and performed major operations on platforms dedicated to the worship of Hindu and Buddhist gods.

Dr. Taylor predicted that modern medicine will aid in preventing some of the diseases which are now prevalent in that country, since the inhabitants are a naturally healthy and stalwart people.

Science News Letter, August 11, 1951

## SURGERY

**100 to Get "Blue Baby" Operation Each Year**

► EACH YEAR 100 babies will have the "blue baby" or other needed heart operation through a plan sponsored and financed by the U. S. Children's Bureau.

The plan is to provide surgical and hospital care for these children in regional heart centers throughout the country. First such center is now in operation at New Haven to serve Connecticut and Rhode Island.

The Children's Bureau plans to spend \$100,000 yearly to foster the program through allocations to State official crippled children's agencies. Cost of a "blue baby" or similar operation including hospital and other expenses is estimated at \$1,000 per baby.

Science News Letter, August 11, 1951

# ONE FIELDS

## ZOOLOGY

## Giant Gorilla, Bamboo, Marks 25th Birthday

► BAMBOO, THE Philadelphia zoo's giant gorilla, longest-lived of his kind in captivity, marked his 25th birthday on Sunday, Aug. 5, without a cake or other celebration.

Fed a carefully balanced diet, regulated so that his daily food intake does not make him fat, the great beast weighs about 435 pounds and stands six feet tall. He arrived at the Philadelphia zoo 24 years ago weighing only 11 pounds, inside a suitcase belonging to an animal dealer.

One of the gorilla's favorite pastimes is tossing any handy object at his keepers and visitors. A fine-mesh fence has been erected around his outdoor cage to protect visitors.

Bamboo is one of the so-called Lowland Gorillas that live in the hilly and mountainous country bordering the Gulf of Guinea. The Mountain Gorilla comes from the highlands of the Belgian Congo. There are about 35 of these strictly African animals now in this country.

Science News Letter, August 11, 1951

## NUTRITION

## Guard Food Against Spoilage in Hot Weather

► HOT SUMMER weather, as experienced housewives know, calls for double precautions to keep food fresh and wholesome. And with the present price of most foods, no housewife wants to be forced to throw any away.

Give the coldest space in the refrigerator to the most perishable foods, is the advice of home-economics experts. The coldest space is usually nearest the freezing cabinet. The foods which need coldest storage because they spoil most easily are: fresh and cooked meat, poultry and fish; meat broth, gelatin dishes; milk; milk-and-egg dishes like custard; and cottage or other soft cheeses.

In general, these very perishable foods keep best if covered. Uncooked meat should be loosely covered, or simply taken out of its wrappings and placed in the meat compartment of the refrigerator which provides it with enough ventilation for good keeping.

When putting foods in the refrigerator take care not to crowd them so closely together that the circulation of cold air around them is cut off. Let cooked food cool to room temperature before putting it in the refrigerator in order not to heat up the atmosphere inside and overwork the motor. However, as soon as the food has cooled, get it into the refrigerator promptly.

## HORTICULTURE

## Tomatoes in Alaska Can Now Be Home Grown

► HOW TO grow such warm or hot season crops as tomatoes, squash, watermelon or egg plant during the short Alaskan summer is explained by Dr. Basil M. Bensin of the University of Alaska Extension Service in College.

Vegetables that require a good deal of heat and light for maturity are usually either flown into Alaska or are just not obtainable. By growing such vegetables out-of-doors, using carefully planned methods and special devices, sun reflectors, for instance, Alaskan housewives can assure an adequate supply for their families.

To get the most good out of the limited sunshine, garden beds should be planted in an east-west direction, Dr. Bensin points out. Dusting the soil with coal dust or any black substance aids considerably in warming up the ground as well as the air immediately above the surface of the plants, thus speeding up growth.

Metal, wood or plastic, even cloth or paper coated with aluminum paint can be used to make a reflector to increase the heat and light on the plants. Half-barrel and barrel tubs with reflectors or radiators behind them can also be used successfully to grow squash and cucumbers, for instance.

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## BIOCHEMISTRY

## Calcium Involved in Artery Hardening

► CALCIUM AS well as fat is involved in arteriosclerosis, or, as the layman calls it, hardening of the arteries. Chemical studies showing this have been made by Dr. A. I. Lansing at Washington University in St. Louis.

Dr. Lansing's work, according to the American Cancer Society which supported it in part, shows that arteriosclerosis is a composite disease. It consists of damage to the blood vessels whereby their inner lining is loaded with a fatty material called cholesterol while the elastic tissue in the wall becomes encrusted with calcium salts.

The aging process leads to the breakdown of the elastic tissue and cholesterol then accumulates in the lining over the damaged areas.

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## HORTICULTURE

## Better Red Pepper from Cross with Mexican Plant

► WILD PLANTS from foreign soils often furnish the characters needed to develop resistance to diseases in cultivated plants or to eliminate from them certain undesirable characteristics.

A cross has been made between a tiny-fruited chili pepper, Chili Piquin, found in Mexico and some of the large varieties of peppers now on the market. Paul G. Smith of the truck crops division of the University of California at Davis, predicts this can raise the quality and intensify the color of American manufactured red pepper, paprika, and chili powder.

In varieties now cultivated in the United States woody tissue of the stems and calyx remains firmly attached to the picked fruit. Because of high labor costs, the tissue is processed with the fruit in the ground powder, lowering both quality and color of the product.

The wild pepper, Chili Piquin, located after a wide search through many Mexican varieties, has fruit that separates readily from the calyx and stem. By crossing, back-crossing, and outcrossing, the heritability of this character was tested by the Davis geneticist and is being incorporated into varieties suitable for commercial use.

As experimentally developed, the stem remains on the plant when the ripe fruit of the new variety is picked.

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## AERONAUTICS

## Written Exam Now Required For Private Pilot Ratings

► WOULD-BE pilots of private airplanes have to take written examinations to get ratings since Aug. 1, according to amended regulations recently adopted by the Civil Aeronautics Board. These examinations will test knowledge of civil air regulations, navigation, piloting, weather recognition, and safe aircraft operating procedures.

Also an increased amount of cross-country flight instruction and solo practice are required. Fifteen hours of dual instruction and 25 hours of solo practice are the amounts set for a private pilot certificate. All flights logged as cross-country must include a landing at least 25 miles from the point of departure.

Private pilot certificates are issued by the Civil Aeronautics Administration and it is the CAA, not the CAB, that will give the examinations. The questions for the written examination will be taken from a recent publication of the CAA entitled *Questions and Answers for Private Pilots*. Copies of this booklet are available from the Government Printing Office, Washington, D. C., for 15 cents each.

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## MALACOLOGY

# Collecting Shells Scientific

**Sea shells are fascinating to discover and exhibit, and many of them can be found inland. Some look like a worm, some like a bleeding tooth.**

By MARTHA G. MORROW

► COLLECTING SHELLS is a favorite pastime for those who vacation at the ocean. But others who never see the waves also collect shells. Thousands enjoy this scientific hobby.

Most shell enthusiasts like to collect their own on trips to the ocean-side. Some travel thousands of miles by train or car, steamer or Chinese junk, to secure unusual varieties.

Others are satisfied to be arm-chair collectors, enjoying gifts brought back by friends and acquaintances, or buying unusual and lovely shells rounded-up by South Sea natives and African tribesmen.

Those who live on the seashore or often visit the ocean have a wealth of shells at their beck and call. But others who live inland also can become successful amateur conchologists.

Freshwater mussels are found all over the country, wherever there are lakes, rivers and creeks. Snails live everywhere, in fields, in ponds and streams, up trees and bushes, even in the desert. Slugs, despised by gardeners, are merely snails whose ancestors have learned to do without their shells.

Buried or fossil shells are often found where the bank of a stream or lake is being washed away, or where an artificial excavation is being made. Such shells have usually lost their colors, but their interesting shapes remain. Some near the surface undoubtedly belonged to mollusks that lived quite recently; others, more deeply buried, probably housed tiny animals thousands and even millions of years ago.

### Shell Sizes Vary

Shells range in size from ones no larger than the head of a pin to Giant Clam shells weighing 500 pounds or more. The Giant African Snail shell grows five to six inches long, while the "Punctum," which lives in leaf mold, is but a fraction of an inch. Some conch shells are large enough to be used as vases, others are so dwarf you can hold several dozen in the palm of your hand.

Often tinted rainbow-colors, shell patterns are frequently beautifully symmetrical. Some shells like the cowry have a high natural luster while others are lined with iridescent mother-of-pearl.

If you plan to collect shells, be sure to take a container along on your hunt for those that please you. Even apparently strong shells are not as stone-strong as they look, and tumbling them about in a loose mass will soon break them. Fortunately, the simplest boxes will do.

Don't wait until you have figured out the names of all your shells before you arrange and classify them. Just put the ones of the same shape together. Shape is more important than either color or size in classifying shells. State on your label exactly where it was found and the date—the shell can be identified later.

### Shell Kit Available

Although some shell enthusiasts travel all over the world to collect rare shells, others enjoy those obtained by well-traveled friends or professional collectors. Six interesting shells have been collected for you by SCIENCE SERVICE. The shells come not just from the Florida Keys, but from far-away East Africa, the Philippine and Baha-ma Islands.

One shell looks so much like a worm it has been dubbed the "worm shell." Another, because of its brilliant markings, is appropriately named the "bleeding tooth."

The pecten shell was once the house of an animal we eat as scallop. The animal that created the tellina shell—it took two to house the mollusk—could burrow deep in the sand. The cowry, aristocrat among shells, is noted for its high natural polish.

The little strombus shell once housed an animal that could jump and rotate its shell



**UNUSUAL SHELLS**—The "worm shell" that once housed a sea-faring mollusk points to a tiny cowry, noted for its high natural polish. The strombus (upper left), the delicate tellina (lower left), the "bleeding tooth" (lower right) and pecten, easily spotted by its two "ears", are the other shells in this photograph.



**SNAIL SHELLS**—Carefully separated and labeled, these snail shells are from Dr. Carlos de la Torre's Cuban collection. They were collected inland.

from side to side. It is a miniature edition of the giant conch shell that seems to give forth the ocean's roar when you hold it up to your ear. All members of this family have a peep-hole notch in the lower outer lip to allow the animal to look around without sticking its stalk-like eyes out too far.

This shell collection is available for the nominal cost of 50 cents each. Just write SCIENCE SERVICE, 1719 N St., N. W., and ask for the Sea Shell kit. These shells demonstrate the two main classes of mollusks. About three of every four shells are univalves, with a single spiral shell. The snails and their relatives build univalve shells. The bivalve mollusk has two pieces, joined by a hinge, and is typified by clams, mussels and oysters.

The most valuable shells are not necessarily those with the most beautiful colors, the largest or the most delicate. As with postage stamps, it is rareness that gives value to a shell. A considerable number of small and inconspicuous shells have been found only once by any man, amateur or professional.

#### Some Shells Are Rare

Best known of the rare shells is a large and beautiful "Glory of the Sea" Cone, found in the Philippine area. Only 18 to 22 have been spotted to date. Another scientific beachcomber's treasure, of which our leading museums can boast of no more than 60, is the Golden Cowry, rare relative of the small, shiny shells used by South Sea and African natives as ornaments or money.

Amateur collectors are continually expanding man's knowledge of shells. Many of the discoveries by amateurs are made by keen-eyed enthusiasts who know shells so

well they are quick to notice unusual ones. Some are picked up by alert individuals, looking for something new to them, who at the time do not realize that these shells may also be new to science.

Several hundred American shell collectors are banded together in a national organization known as the American Malacological Union, designed to include everyone interested in shells or the animals that grow in the shells. Mrs. Harold R. Robertson, 136 Buffum Street, Buffalo 10, N. Y., is its secretary; Dr. J. P. E. Morrison of the Smithsonian Institution, Washington, D. C., is its present president.

#### Provide for Growth

Since a shell is made of hard, stony stuff—it is essentially the same as limestone or marble—obviously it can't stretch as the animal grows, the way your skin does. So mollusks have to use other devices.

Two-shelled mollusks like oysters and clams, tellinas and pectens, lay down a new layer of shell material inside the original small shell and projecting a little beyond its edges. Thus the old shell layer is on the outside, the new one inside; the first-formed part of the shell is thickest, the later parts near the edge are thinnest.

The coiled shells of the many and varied members of the snail family do the same thing in a somewhat different way. Here the animal moves forward as it grows, enlarging the mouth of its shell. Thus one layer is in front of the other instead of on top of it.

The oldest part of the snail's shell—what was once the baby snail's tiny house—is found in the middle of the coil of the flat type of snail shell, or at the tip of the shell in the pointed, spire-shaped type.

#### Tenants Interesting Too

The animals that build the shells are themselves interesting creatures. The two-shelled mollusk, which must have water to live, has only a rudimentary head without the two eyes we see on snails. This animal has two tubes, called siphons: water is constantly drawn into one siphon and discharged through the other. This is how the animal gets its food and oxygen. The mollusk's body is tightly attached to both shells, which it can open and close at will.

The snail building a univalve shell has a long, worm-like body spirally coiled. The head and large, strong muscle called the "foot" are at one end, sheathed in a fleshy mantle that hangs down around them like a skirt. The foot by which it creeps and digs is often seen protruding from the shell. On this is a tough, horn-like "door" with which the mollusk shuts itself into its house when danger threatens.

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A magnetic iron ore deposit, recently discovered near Reading, Pa., is the first new ore deposit found in this country in years.

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## MARINE BIOLOGY

**Fish Found in Mid-Pacific  
Once Called "Desert of Sea"**

► THE OPEN waters of the tropical Pacific, the so-called "deserts of the sea," are far more productive than was once believed.

Dr. Milner B. Schaefer, research director of the Inter-American Tropical Tuna Commission, with headquarters at the University of California's Scripps Institution of Oceanography, reports that large schools of tuna have been found in the tropical mid-Pacific where it was once thought that none existed. The recent U. S. Navy-University of California expedition, "Operation Midpac," found many varieties of sea animals in latitudes once thought barren.

Three large-scale investigations of these "deserts of the sea" are now under way. One is the California Cooperative Sardine Research program in which four agencies are investigating coastal waters from Canada to Lower California. The second is the U. S. Fish and Wildlife's Pacific Oceanic Fishery Investigation which is studying the waters around the Hawaiian Islands. The third is Dr. Schaefer's own organization which is surveying Central American waters.

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## ORNITHOLOGY

**NATURE RAMBLINGS****Hell-Diver**

► THE U. S. Biological Survey lists the grebe as a friend of the fishes, because it eats the giant water-bug and a number of other predaceous little monsters of the shallow waters, that prey upon infant fish, and make the hatcheries worker's life a burden. Investigation of the digestive systems of these birds has disclosed the remains of scores and hundreds of these ravenous winged dragons of the lesser world.

But even aside from usefulness to us, the grebe is an interesting bird on its own account. The grebe gets its infernal nickname not in mockery or derogation, but as a compliment. It is the champion submarine of freshwater birds, the "down-deep-divin'est, long-under-stayin'est" of feathered swimmers. Wary and easily alarmed, it disappears in a split second, leaving scarcely a ripple to show where it has been. And if

## MEDICINE

**Watch for Polio Symptoms**

► THE POLIO season calls for alertness without panic. Good treatment during the acute stage of the disease will help to save lives and reduce paralysis, medical authorities teach.

The onset of the disease is rapid. The first stage is comparatively mild. Sore throat, a "head cold," nausea and sometimes vomiting may be among early symptoms. There may be some fever, diarrhea and, conversely, constipation. There may be considerable pain, particularly in the muscles of the legs and arms. The appetite often disappears. Tremor or trembling of the hands and other parts of the body and pain and stiffness of the neck and back are important early symptoms, all of which may occur in almost any combination.

The virus causing poliomyelitis attacks certain nerve cells in the spinal cord which control movement of muscles. When the nerve cells are damaged or completely

you can guess where it is coming up, you are better than any hawk or hunter.

To all appearances, it often stays under water for half an hour on end. But it really is not making a submarine voyage to a place where water is reputed to be very scarce; if you watch carefully, you will see on the surface of the water a tiny ripple. That is made by the tip of the grebe's nose. The bird is still with us, breathing the familiar air, but is using the better part of valor and taking advantage of the best garment of invisibility known. Presently, if you don't shoot or throw stones, the bird will stick its head and part of its neck up for a periscope look around; then, if the situation is satisfactory, up will come the dusky back and wings.

The hell-diver spends its time so little in the air and so much in the water that it has given up almost all of that very important flying organ, its tail. But its twin propellers, its feet, are ideally adapted for work in the water. Instead of being fully webbed, as a duck's are, it has a separate web for each toe. This makes its feet "feather" more easily than those of a duck, and also permits it to have longer toes with freer movement.

These large feet act more or less like snowshoes when the bird goes ashore on soft mud, which it frequently does. It seems to like this kind of terrain and builds its semi-floating nest of reeds on the oozy margin of its stream or pond. This habit has earned the grebe its other nickname of mudhen.

► The hell-diver is one of the most widely distributed of American birds. It is found all over both North and South America, excepting only the very extremities of the continents.

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destroyed, the dependent muscle withers away in proportion to the amount of nerve damage. If the damage to the nerve cells is slight, the results in crippling are slight. Seriously affected nerve cells do not regrow. When this occurs, the paralysis is permanent.

It is generally conceded in polio season that children should not be removed from their normal routine. This is also true of adults. In this day and age complete isolation cannot be achieved, and quarantine in poliomyelitis has not had the expected results. There are some instances of an entire family developing the disease, while in others a single case in a large family has been reported.

Parents should be alert to the slight symptoms of early poliomyelitis. A healthy youngster is not ordinarily listless. Watch for fever and fatigue. Then get the child to bed at once and call your physician.

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## MARINE BIOLOGY

# Weird Fishes Discovered

Some forms previously unknown in the Pacific are being dredged up from ocean's depths by special sort of deep-sea fishing net, the mid-water trawl.

► WEIRD DEEP-SEA fishes—some of them not previously found in the Pacific, others totally unknown to science—are being dredged up out of the cold black depths of the ocean by a new scientific tool of revolutionary design called a "mid-water trawl."

A special sort of deep-sea fishing net, the midwater trawl was devised by Dr. Carl L. Hubbs, John D. Isaacs and Lewis W. Kidd, of the University of California's Scripps Institution of Oceanography.

Though still in developmental stages, the new trawl has already been towed to a depth of 9,000 feet—almost two miles below the surface of the sea. Future plans call for even larger trawls to dredge up animal life from the floor of the ocean.

New to the Pacific, and previously found only infrequently elsewhere, is the gulper, a small marine fish in whose design nature curiously anticipated the development of the new trawl. The gulper's skull, excluding the jaw, is the size of a man's thumb. Its mouth, however, is larger than a human mouth. The jaw is shaped very similarly to the specially designed vane that is the chief new element of the midwater trawl.

In the mid-depths of the Pacific live weirdly specialized marine creatures. Most are equipped with light organs. A species of lantern fish, unknown heretofore off California, has minute bluish pinpoint light sources, and two "eyes in reverse," one on the upper, one on the lower surface, near the tail fin. These organs consist of a source, reflector and lens.

One purpose of the light organs, scientists think, is to attract other unwary fishes for food. Survival is a bitter business in the mid-depths. No plants grow there. The ferocity of the struggle is reflected in the dragon-like appearance of the creatures found. Most of them are quite small.

As another example of the work the trawl is doing, Dr. Hubbs cited the recent finding of snipe eels. Only two individual snipe eels had appeared in collections before, and these were of the same species. In the preliminary trials of the new trawl, 50 specimens of four distinct species have been collected.

A fish with a neck has also been found. This is *Derichthys serpentinus*, a sort of eel. It has not been reported previously from the Pacific area.

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## PHYSICS

# The Birth of a Flame

## See Front Cover

► WHEN A match is struck a flame is born. The action is instantaneous to the human eye but not so to the camera. There are "stages" to the process, a recent camera study shows. To show the stages, a camera was used which made a series of pictures at intervals only a few millionths of a second apart.

These unusual photographs were made in the Applied Physics Laboratory of Johns Hopkins University at Silver Spring, Md., where such notable work as the development of the ram-jet engine and the proximity fuse was carried out. They were taken by Dr. H. Lowell Olsen, Robert B. Edmonson and Everett L. Gayhart in conjunction with combustion studies.

In the work a tiny jet of hydrogen was used as fuel. Ignition was made with a tiny electric spark between two fine pin points. Photos were made by the so-called Schlieren method, a method of making visible optical irregularities in transparent substances such as glass or a gas. This

Schlieren system is probably best known from its use in photographing the shock waves formed by air passing at great speeds over airplane models in wind tunnels.

In the first of these pictures taken at the Applied Physics Laboratory of the flame when 5.8 millionths of a second old, that is at 5.8 microseconds, there is a circle around the tiny globule of burning hydrogen that is the shock wave produced by the spark. A photograph at 9.1 microseconds shows that the wave has spread out and weakened to become a sound wave.

A picture at 457 microseconds indicates that the flame core is much developed and that it has left the spark gap and begun to move in the stream of gas. Another picture at 1,112 microseconds shows that combustion in mid-stream has expanded rapidly and the kernel has spread into the turbulent sides of the stream and been broken up. Combustion will be at least 2,000 microseconds old before it reaches the entire boundaries of the hydrogen stream, according to these Johns Hopkins scientists.

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## PHARMACOLOGY

**Cigarette's Nicotine Can Constrict Blood Vessels**

► THE NICOTINE absorbed from ordinary smoking of one or two cigarettes may cause constriction of the heart's blood vessels, called coronary vessels, Dr. J. H. Burn, professor of pharmacology at Oxford University, reports in the BRITISH MEDICAL JOURNAL (July 28) in London.

Persons of advancing years who show signs of heart irregularity or of involvement of the heart's blood vessels "should be told not to smoke because smoking involves some unknown degree of restriction of coronary circulation," Prof. Burn states.

He specifies persons of advancing years because he thinks that as we grow older the ability of the body to destroy nicotine grows less.

Nicotine causes constriction of the coronary blood vessels in dogs, Prof. Burn reports. It does this apparently by stimulating the pituitary gland in the head to release a hormone believed to be the same as vasoconstrictin, which constricts blood vessels.

The hormone is called the antidiuretic hormone because it checks the increased secretion of urine caused by drinking water. Smoking does the same thing, and the hormone is found in the urine after smoking.

Ordinary smoking of one or two cigarettes causes release of from three to 190 milliunits of the pituitary hormone into the blood stream. This concentration of hormone in the blood is enough to cause coronary constriction in the dog "and may therefore have the same effect in man," Prof. Burn reports.

He points out, also, that in the last 50 years there has been a steady increase in deaths from coronary disease. This became marked after the first World War, and during about this same period, tobacco consumption in the British Isles has increased three-fold. The two increases may not be related, but Prof. Burn says, "it is possible that smoking is a contributory factor" to heart deaths.

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**CAVE EXPLORATIONS IN IRAN:** 1949—Carleton S. Coon—University of Pennsylvania Museum, 124 p., illus., paper, \$1.50. Official report of the findings of evidence of Stone Age farmers and herders. (See SNL, April 26, 1951).

**CONTRIBUTIONS TO THE FLORA OF VENEZUELA:** Julian A. Steyermark—Chicago Natural History Museum, 242 p., illus., paper, \$4.00. Volume I of Botanical Exploration in Venezuela listing and describing the plants found in that country on an expedition which took place from Dec. 1943 to June 1945.

**A FIELD GUIDE TO THE SHELLS OF THE ATLANTIC AND GULF COASTS:** Percy A. Morris—Houghton Mifflin, Revised ed., 236 p., illus., \$3.75. Seashore vacationists will find this not only handy in identifying shells but also in learning something about their inhabitants.

**FROM LITTLE ACORNS:** The Story of Your Body—Frances Butterfield—Renbayle, 158 p., illus., \$2.50. Answers in an entertaining and factual way a child's questions about the body including sex and birth.

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**THE HUMAN ORGANISM AND THE WORLD OF LIFE:** Clarence W. Young and G. Ledyard Stebbins—Harper, Revised ed., 897 p., illus., \$6.00. Much botanical, zoological, and ecological material has been added to this standard biology text.

**INJURY TO SEED BEANS DURING THRESHING AND PROCESSING:** U. S. Dept. of Agriculture Circular No. 874—Eben H. Toole et al.—Govt. Printing Office, 10 p., illus., paper, 5 cents. Present use of small grain combines for threshing makes this of special interest to bean growers.

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**WOOD BOX COLUMNS AND THEIR DESIGNS:** Engineering Experiment Station Series No. 79—B. Y. Kinsey, Jr.—Virginia Polytechnic Institute, 24 p., paper, 25 cents. Study of structural strength of these hollow columns.

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